

Cooling agents, cryogenic liquids like liquid Nitrogen and solid Carbon Dioxide

Special provisions (ADR 5.5.3) for road transport

Packages containing a cooling agent (see also ADR 5.5.3.3)

- Packaged dangerous goods requiring a cooling agent assigned to P620 (UN 2814 and UN 2900), P 650 (UN 3373) and P904 (UN 3245) shall meet the appropriate requirements of that packing instruction.
- The primary and secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.
- Cooling agents shall be placed outside the secondary packaging
- Interior supports shall be provided to secure the secondary packagings in the original position.

Marking of packages containing a cooling agent (see also ADR 5.5.3.4)

Dry Ice: Packages shall be marked with "CARBON DIOXIDE, SOLIDE, AS COOLANT"

Liquid nitrogen: Packages shall be marked with "NITROGEN, REFRIGERATED, LIQUID, AS COOLANT" (see Special Provision 593)

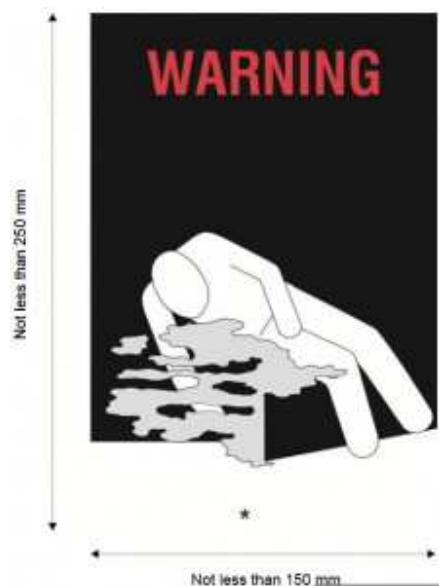
Ice: is not subject to ADR. It shall be placed outside the secondary packaging or in the outer packaging or an overpack. The outside packaging or the overpack shall be leakproof. No marking required.

Marking of vehicles or containers containing a cooling agent

Dry ice and liquid nitrogen used for cooling purposes present a risk of asphyxiation. Vehicles carrying such substances must be well ventilated.

Only if there is an actual risk of asphyxiation in the vehicle or container, marking of vehicles and containers as well as specific documents are required (ADR 5.5.3.6 and 5.5.3.7).

They shall be marked with the following warning mark:



* Insert the name of the coolant followed by the words "AS COOLANT":

For example:

CARBON DIOXIDE, SOLIDE, AS COOLANT or
NITROGEN, REFRIGERATED, LIQUID, AS COOLANT

Further information and air transport: Consult shipper for detailed instructions

Liquid Nitrogen

Class 2, Division 2.2, non-flammable non-toxic gas

UN name: nitrogen liquid, refrigerated

UN number 1977

Special Provision 593 (ADR 3.3)

Import/Export: no specific requirements

Packaging

Packing instructions: IATA / ICAO PI 202 / ADR P 203

Plastic primary receptacles and secondary packagings capable of withstanding very low temperatures must be used. The primary and the secondary container must maintain their containment integrity at the applied temperatures as well as the temperatures and pressure of air transportation.

Labelling:

Non-flammable, non-toxic gas label (No 2.2), see ADR 5.2.2.2.2

For air transport: Cryogenic liquids handling label, (IATA 7.2.4.3)

not necessary if liquid nitrogen is fully absorbed in a porous material and the design of insulated packaging would not allow the build-up of pressure within the container and would not permit the release of any refrigerated liquid nitrogen irrespective of the orientation of the insulated packaging.

Orientation arrow, see ADR 5.2.1.9.

Transport documents for air transport.

Solid Carbon Dioxide (dry ice)

Class 9, Miscellaneous dangerous substances

Solid carbon dioxide has a temperature of about – 70 °C and can cause severe burns to skin upon contact. When solid carbon dioxide sublimates directly into gaseous carbon dioxide, the resulting gas is heavier than air and can cause suffocation in confined areas.

Dry ice is not subject to ADR.

UN name: Carbon Dioxide, solide

UN number: 1845

Import/Export: no specific requirements

Packaging

Packing instructions: IATA/ICAO PI 954

Dry ice must not be placed inside the primary or secondary receptacles of biological substances because of the risk of explosions. An overpack may be used to contain dry ice. Packages containing solid carbon dioxide for air transport must be designed and constructed so as to prevent build-up pressure due to the release of carbon dioxide gas.

Arrangements between shipper and carrier must be made for each shipment to ensure ventilation safety procedures are followed.

Labelling:

Class 9 label (No 9), see ADR 5.2.2.2.2

Transport documents for air transport.